

Application No. 10/707,469  
Technology Center 1762  
Amendment dated August 16, 2007  
Reply to Office Action dated April 16, 2007

### REMARKS

As of the filing of the present Office Action, claims 1-32 were pending in the above-identified US Patent Application. In the Office Action, the Examiner withdrew claims 21-32 from consideration due to a restriction requirement, objected to Applicants' declaration, and rejected claims 1 through 20 under 35 USC §103. In response, Applicants have amended the specification and claims as set forth above. More particularly:

The specification has been amended at paragraphs [0003], [0004], and [0013] to update the status of two U.S. patent applications that were cited in the specification and have since issued.

The specification has also been amended at paragraph [0008] to correct a typographical error.

Claims 1-3, 6-10, 12, 14-17, and 19 to use the term "metal" instead of "element" and to eliminate some usages of the phrase "at least one of," the latter of which is for readability and not to limit each composition in question to a single composition as evident from claims 3 and 12.

Independent claims 1 and 12 have been further amended to recite their respective coating compositions in their preambles, and to specify that their respective evaporating/projecting steps are performed in the presence of

Application No. 10/707,469  
Technology Center 1762  
Amendment dated August 16, 2007  
Reply to Office Action dated April 16, 2007

oxygen to dissociate the metal from the carbide compound and oxidize the metal. Support for these amendments can be found in Applicants' specification at paragraph [0008] as well as original claim 12.

Independent claim 12 has also been amended to recite the "oxide formed by oxidation of ytterbium, neodymium, and/or lanthanum" instead of "oxide formed by oxidation of ytterbia, neodymia, and/or lanthanum," the latter of which is technically incorrect.

Withdrawn claims 21 through 32 have been canceled without prejudice.

New claims 33 and 34 (which depend from claims 1 and 12, respectively) require oxygen to be present during the evaporating/projecting step in excess of that necessary to ensure the deposition of the oxide compounds. Support for this limitation can be found in Applicants' specification at paragraph [0017].

Applicants believe that the above amendments do not present new matter. Favorable reconsideration and allowance of remaining claims 1-20, 33, and 34 are respectfully requested in view of the above amendments and the following remarks.

Application No. 10/707,469  
Technology Center 1762  
Amendment dated August 16, 2007  
Reply to Office Action dated April 16, 2007

### **Oath/Declaration**

The Examiner advised that Applicants' declaration was defective, as not being properly executed. In response, Applicants submit herewith a "Declaration and Power of Attorney" that addresses this issue. Therefore, Applicants respectfully request withdrawal of this objection.

### **Rejection under 35 USC §103**

Independent claims 1 and 12 and their dependent claims 2-11 and 13-20 were rejected as being unpatentable over U.S. Published Patent Application No. 2002/0172838 to Rigney et al. (the "Rigney application," now issued as U.S. Patent No. 6,586,115) in view of U.S. Patent No. 6,492,038 to Rigney et al. (the "Rigney patent"). Applicants respectfully request reconsideration of this rejection in view of the following comments.

Applicants' invention is directed to an evaporation process for depositing a coating that contains oxide compounds and at least one metal oxide that may have a vapor pressure significantly different than the other oxide compounds, such that the oxide compounds and the metal oxide are difficult to simultaneously deposit from sources containing the oxide compounds and the metal oxide. Simultaneous deposition of the oxides is

Application No. 10/707,469  
Technology Center 1762  
Amendment dated August 16, 2007  
Reply to Office Action dated April 16, 2007

nonetheless achieved by evaporating at least one source that contains a carbide of the metal. During evaporation, the metal dissociates from the carbide compound and then oxidizes, so that the resulting vapor cloud is able to form a coating containing the oxide compounds, the oxide of the metal dissociated from the carbide compound, and one or more of elemental carbon, a carbon-containing gas, and precipitates of the carbide compound. See, for example, paragraph [0008].

Under the §103 rejection, the Examiner cited the Rigney application for disclosing methods for depositing ceramic coatings containing multiple oxides (such as yttria and zirconia) and a third oxide (such as lanthana and/or neodymia). While deposited in the presence of oxygen, the evaporation sources are not disclosed as including carbides. The Examiner then cited the Rigney patent for disclosing methods for depositing ceramic coatings containing multiple oxides (such as yttria and zirconia) and carbide-based precipitates, and concluded that it would have been obvious to "use the carbide compound as suggested by [the Rigney patent] as the source of the metal oxide of [the Rigney application] in order to produce carbide-based precipitates into the thermal barrier coating."

Applicants respectfully request reconsideration.

Application No. 10/707,469  
Technology Center 1762  
Amendment dated August 16, 2007  
Reply to Office Action dated April 16, 2007

MPEP §706 cites the standard of patentability stated by the Supreme Court in *Graham v. John Deere*, 148 USPQ 459 (1966), as follows:

Under Section 103, the scope and the content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved.

The court in *In re Wright*, 6 USPQ2d 1959, 1961 (Fed. Cir. 1988), further stated that

it is the invention as a whole that must be considered in obviousness determinations. The invention as a whole embraces the structure, its properties, and the problem it solves.

The Examiner considered Applicants' invention to be obvious in view of the combined teachings of the Rigney application and patent. However, neither teaches a coating process that entails (using the language of claim 1):

evaporating the at least one evaporation source in the presence of oxygen to dissociate the metal from the carbide compound, oxidize the metal, and produce a vapor cloud that contacts and condenses on the surface to form [a] ceramic coating comprising the oxide compounds [and] the oxide of the metal dissociated from the carbide compound . . . .

Application No. 10/707,469  
Technology Center 1762  
Amendment dated August 16, 2007  
Reply to Office Action dated April 16, 2007

While the Examiner states "it would have been obvious to use a carbide compound such as  $\text{LaC}_2$  and  $\text{NdC}_2$  in order to form the metal oxide such as lantana and neodymia as suggested by [the Rigney application]," Applicants can not find any suggestion in the Rigney application that lanthana or neodymia could be deposited by evaporating a lanthanum or neodymium carbide. At best, the Rigney patent merely teaches evaporating a carbide compound to form a coating that contains carbon, the carbide compound, or another carbide compound, but there is no mention of the coating also containing an oxide derived from the source of the carbon or carbide compounds.

In view of the above, the differences between Applicants' claimed process and the combined teachings of the Rigney application and patent include the failure of the Rigney application and patent to disclose or even suggest evaporating a metal carbide in a manner that dissociates and oxidizes the metal to form and deposit an oxide of the metal.

Finally, the problem solved by Applicants - the difficulty of depositing some combinations of oxides - is completely different from that solved by the Rigney application and patent, and there is no other basis of record for motivating one skilled in the art to further modify the teachings of the Rigney

Application No. 10/707,469  
Technology Center 1762  
Amendment dated August 16, 2007  
Reply to Office Action dated April 16, 2007

patent for the purpose of solving this problem by carrying out Applicants' dissociation and oxidation processes. Instead, the motivation for such additional processes is found entirely within Applicants' specification.

For the above reasons, Applicants believe that the combination of the Rigney application and patent does not fulfil the requirements set forth in *Graham v. John Deere*, and Applicants therefore respectfully request withdrawal of the rejection to the claims under 35 USC §103(a).

Application No. 10/707,469  
Technology Center 1762  
Amendment dated August 16, 2007  
Reply to Office Action dated April 16, 2007

**Closing**

In view of the above, Applicants believe that all issues outstanding from the Office Action have been addressed, and that the claims define patentable novelty over all the references, alone or in combination, of record. It is therefore respectfully requested that this patent application be given favorable reconsideration.

Should the Examiner have any questions with respect to any matter now of record, Applicants' representative may be reached at (219) 462-4999.

Respectfully submitted,



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Attachments: Substitute Declaration; Petition for Extension of Time